

## **PRECIOUS STONE SETTING**

### **BACKGROUND OF THE INVENTION**

[0001] The present invention relates to a method for setting precious, semi-precious and synthetic stones, typically diamonds, and to stones and precious stone settings which have been configured for practicing the setting method of the present invention.

[0002] French patent specification No. 802 367 discloses forming notches in precious stones, such as in diamonds, for receiving in the notches metallic projections which are formed in walls of the setting, thus securing the stones in place. Variations on the basic stone mounting method of the aforementioned French patent specification are described in U.S. Patent Nos. 4,738,240 and 4,813,246.

[0003] The method described in the 802 367 French specification is particularly useful for obtaining so-called invisible mounting of stones, i.e. mountings in which the stones closely abut one another in a manner which conceals the underlying structure that holds the stones.

[0004] U.S. Patent No. 4,738,240 teaches a generally horizontally oriented notch formed at each corner of a square diamond in the region of the pavilion below the girdle. Each notch comprises two facing surfaces, including a lower surface which extends substantially parallel to the plane of the table of the diamond and an upper surface which makes an angle of about 30° with respect to the lower surface. As in the French specification, the mounting, i.e. setting, contains projections which are designed to engage the notches and thus secure the diamonds. A great many references exist in the prior art dealing with invisible mounts and the undercutting or notching of the diamonds and their mounting to support elements. Some of these references include U.S. Patent Nos. 5,419,159; 5,520,017; 2,141,363; RE 37,854; 5,423,196; and 5,123,265. Additionally, numerous foreign references also deal with invisible mountings, namely British reference 465 772, French

reference 833,234 and British reference 490,021. The disclosures of these references are incorporated herein by reference.

[0005] To “invisibly” mount a large number of diamonds, the approach of the prior art has been to notch the diamonds and to mount them in a setting having two or more parallel walls, with metallic projections, e.g. continuous ridges, ribs or the like, protruding from these walls for engaging the notches. Typically, these walls define channels in which the diamonds are set abutting one another in accordance with the invisible mounting procedure. The assembly is held together by the ribs being matched against the edge-long grooves cut in the stones below the girdle. When the stones are placed into the setting the ribs bite into the grooves and thus hold the stones.

[0006] In U.S. Patent No. 5,072,601 a precious stone setting method is disclosed which involves providing a setting that comprises substantially parallel, flat, surface walls that are spaced apart to define channels in which plurality of diamonds are set in line following one another. The diamonds themselves are processed to have sharp upwardly pointing edges that bite into the walls to hold the diamonds firmly and securely in the channels.

[0007] Although these are satisfactory methods for mounting the diamonds, the disadvantage of these prior art methods is that they require linear arrangement of the diamonds which limits the types of designs which can be created for a piece of jewelry. For example, the diamonds must be arranged in rows one after the other.

## **SUMMARY OF THE INVENTION**

[0008] Accordingly, it is a primary object of the present invention to provide settings for precious stones, particularly diamonds, and a precious stone mounting method which overcome the design limitations imposed by the prior art mounting methods.

[0009] It is a further object of the present invention to provide a method which permits different types of stones to be used in a single setting.

[0010] The invention involves modifying the grooves on the stones which in turn allows the way settings are created to be changed. As opposed to the traditional edge-long

straight grooves, the present invention utilizes smaller incisions made at the corners of a stone. The incision extends over two sides of a corner and meets at the corner. A groove is made at each corner of the stone.

[0011] Pursuant to these objects, and others which will become apparent hereafter, one aspect of the present invention resides in a jewelry piece having a precious stone with a visible upper surface and a body extending below the upper surface. The body has facets that meet to form corners. Each facet has a groove at each corner that extends from the corner along only a portion of the facets so that the grooves of the facets that form each corner meet at the corner. The stone is mounted in a setting that includes a prong member having an upper end and a lower end. A notch is provided along an entire outer periphery of the prong member in a region of the upper end so as to form a projection. The groove in at least one corner of each stone is engaged by the projection of a prong member to hold it in a setting.

[0012] The present invention provides many advantages over the prior art. For example, it is possible to use smaller independent prongs that can be placed in various patterns so as to allow the creation of more elaborate settings as compared to the rigid structures formed by the use of ribs and channels in the prior art. For example, linear structures that could only be achieved with princess-cut stones using the prior art can now be created using only trillion-cut stones or any combinations of princess and trillion-cut stones. Furthermore, a round-shaped setting can be created using trillion-cut stones according to the present invention.

[0013] Still further, with the present invention it is possible to utilize different types of stones, e.g. the princess (square), trillion (triangular) and marquis cuts, in a single setting.

[0014] Another advantage of the present invention is that the use of smaller support structures compared to the prior art cast a smaller amount of shadows beneath the stones which creates a setting that is closer to being truly invisible than the settings of the prior art.

[0015] Additionally, the present invention can be used in combination with the previously mentioned conventional hand settings.

[0016] Furthermore, the present invention is very beneficial when jewelry is created using the well known "wax-setting" method of manufacturing jewelry. The process of creating a wax setting is complicated by the necessity of carving minute notches in the prongs or ribs manually. With the present invention the smaller incisions made in the corners of the stone create sharp lower edges. This creates the possibility of setting the stones by pushing them into the wax prongs thus eliminating the need for carving notches in the wax prongs manually.

[0017] Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that the drawings are not necessarily drawn to scale and that, unless otherwise indicated, they are merely intended to conceptually illustrate the structures and procedures described therein.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

- [0018] Fig. 1 is a top view of a princess-cut diamond.
- [0019] Fig. 2 is a bottom view of the diamond of Fig. 1;
- [0020] Fig. 3 is a side view of Fig. 1;
- [0021] Fig. 4 is a top view of a trillion-cut diamond;
- [0022] Fig. 5 is a bottom view of Fig. 4;
- [0023] Fig. 6 is a side view in the direction of arrow VI in Fig. 4;
- [0024] Fig. 7 is a top view of a marquis-cut diamond;
- [0025] Fig. 8 is a bottom view of Fig. 7;
- [0026] Fig. 9 is a side view in the direction of arrow IX in Fig. 7;
- [0027] Fig. 10 is a view showing one possible embodiment for mounting trillion-cut diamonds;

- [0028] Fig. 11 is a view showing an alternative arrangement for mounting trillion diamonds;
- [0029] Fig. 12 is a section along the lines XII-XII of Fig. 11;
- [0030] Fig. 13 shows yet another embodiment for mounting trillion-cut diamonds;
- [0031] Fig. 14 shows an embodiment for mounting princess-cut diamonds;
- [0032] Fig. 15 shows yet another embodiment for mounting princess-cut diamonds;
- [0033] Fig. 16 shows an embodiment for mounting two rows of princess-cut diamonds;
- [0034] Fig. 17 shows an embodiment for mounting two rows of princess-cut diamonds;
- [0035] Fig. 18 shows a cross-section along the lines XVIII-XVIII of Figs. 16 and 17.

#### **DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS**

[0036] Figs. 1-3 show a princess-cut diamond 1 having grooves 2 cut into the corners of the facets so that the groove extends over both sides of the corner.

[0037] Figs. 4-6 show a trillion-cut stone 4 with the grooves 2 while Figs. 7-9 show a marquis-cut stone 5 with the grooves 2.

[0038] One arrangement for mounting the stones as cut in Figs. 1-9 will be discussed in connection with Fig. 10. In this embodiment a metal channel 6 is provided which has a base 7 and parallel sidewalls 8 whereby the channel 6 has an approximately U-shaped cross-section. A plurality of prongs 9, 9' are arranged inside the channel to provide fixing points for the trillion-cut stones 4. The prongs 9 are illustrated in a cylindrical shape, but can have any shape which facilitates the mounting of the stones for obtaining the desired stone arrangement. The prongs 9 are fixed to the base 7 while the prongs 9', which are shaped as a semi-cylinder, are fixed to both the sidewall 8 and the base 7.

[0039] For the purposes of holding the stone the prongs have circumferential notches 10 cut into them. These notches 10 permit an upper edge 11 of the prongs 9 to fit into the

grooves 2 of the stones and thus hold them in place. The prongs 9, 9' are arranged so as to engage the stones only at the cut corners.

[0040] As shown in Fig. 10, by mounting these stones at the corners it is possible to mount more than one stone to each prong so that a number of stones can be mounted adjacent to one another to form the desired pattern. The prongs 9 are dimensioned so that when the diamonds 4 are mounted thereon they are disposed very close and, ideally, perfectly abutting one another.

[0041] Fig. 11 shows an arrangement of prongs and trillion-cut stones to form a hexagon. Fig. 12 is a cross-section of Fig. 11 showing how the stones 4 mount on the prongs 9 and abut one another.

[0042] The upper edge 11 engages in the slots 2 of the stones to securely hold them in place.

[0043] Fig. 13 shows a mounting for a single row of trillion-cut stones in the channel 6. The sidewalls 8 of the channel 6 are of a height which corresponds to the depth of the stones being mounted. The semi-cylindrical prongs 9' are arranged on the sidewalls 8 so that the prongs 9' on one wall are arranged midway between the prongs 9' on the opposing sidewall 8. The corners of the stones 4 are then mounted on the prongs so that a continuous row of trillion stones abutting one another is created.

[0044] Fig. 14 shows an arrangement similar to Fig. 13 with the exception that princess stones are mounted. In this case the sidewalls 8 are higher to accommodate the depth of the stones. Furthermore, the prongs 9' are arranged on the sidewalls so as to be directly opposite one another so as to correspond to the square shape of the stones. The stones are pressed in place and create a continuous single row of diamonds.

[0045] A double row arrangement of princess-cut stones using only prongs 9 is shown in Fig. 15. As can be seen here, up to four princess-cut stones can be mounted to each of the prongs. From this drawing it is clear that virtually any configuration of stones is possible due to the flexibility possible for arranging the individual prongs.

**[0046]** Figs. 16 and 17 show a mounting in which the sidewalls 8' of the channel 6' have longitudinally extending grooves 12 that form ribs 13. Prongs 9 are arranged on the base 7' of the channels. In these embodiments the groove 12 in the sidewalls 8' takes the place of the prongs 9' shown in Figs. 10, 13 and 14. As can be seen in Fig. 18, which is a cross-sectional view of Figs. 16 and 17, the groove 12 is not configured the same as the notch 10 of the prong 9. Instead, the groove is configured so that the rib 13 of the wall 8' engages over the edge of the stone in order to hold the stone in place.

**[0047]** Thus, while there have been shown and described and pointed out fundamental novel features of the present invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the present invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Substitutions of elements from one described embodiment to another are also fully intended and contemplated. It is also to be understood that the drawings are not necessarily drawn to scale but that they are merely conceptual in nature. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.